WHAT IS CLAIMED IS:

1. A method of determining a gain offset between transmission channels in a communication system, comprising the steps of:

deriving a first set of channel estimates from symbols received through a first channel;

deriving a second set of channel estimates from symbols received through a second channel; and

determining the gain offset based on the first and second sets of channel estimates.

2. The method of claim 1, wherein the first and second channels are pilot channels.

3. The method of claim 1, wherein the first and second channels are a DPCH and CPICH, respectively.

4. A method of determining a set of complex channel estimates for a transmission channel in a communication system, comprising the steps of:

deriving a first set of channel estimates from symbols received through the transmission channel;

deriving a second set of channel estimates from symbols received through a second channel in the communication system;

determining a gain offset based on the first and second sets of channel estimates; and

determining the set of complex channel estimates based on the gain offset and the first and second sets of channel estimates.

5. The method of claim 4, wherein the gain offset is determined using a second-order equation.

6. The method of claim 4, wherein the gain offset g^{ML} is determined using the following equation:

$$g^{ML} = -\frac{\beta}{2} + \sqrt{\frac{\beta^2}{4} + \alpha},$$

where:

$$\beta = \frac{\sum_{i=1}^{n} \frac{\alpha|\hat{h}_i^D|^2 - |\hat{h}_i^C|^2}{\sigma_{ei}^2}}{\sum_{i=1}^{n} Re\left(\frac{\overline{\hat{h}_i^C}\hat{h}_i^D}{\sigma_{ei}^2}\right)}$$

α is a scale factor based on a spreading factor such that $\alpha = (sf/256)(n_D/n_C)$, where sf is the spreading factor used for the symbols of the transmission channel, 256 is the spreading factor used for the symbols of the second channel, and n_D and n_C are, respectively, the numbers of symbols coherently summed to get the first set of channel estimates $\hat{h}_i^D$ and the second set of channel estimates $\hat{h}_i^C$, and σ_{ei}^2 is an estimated noise variance parameter.

7. The method of claim 6, wherein the complex channel estimate h_i^{ML} is determined using the following equation:

$$h_i^{ML} = \frac{\alpha\hat{h}_i^D + g^{ML}\hat{h}_i^C}{\alpha + (g^{ML})^2}$$

where: α is a scale factor based on a spreading factor such that $\alpha = (sf/256)(n_D/n_C)$, where sf is the spreading factor used for the symbols of the transmission channel, 256 is the spreading factor used for the symbols of the second channel, and n_D and n_C are, respectively, the numbers of symbols

coherently summed to get the first set of channel estimates $\hat{h}_l^D$ and the second set of channel estimates $\hat{h}_l^C$.

8. The method of claim 6, wherein the complex channel estimate is determined by performing a linear combination of the first and second set of channel estimates based on the gain offset.

9. A method of determining a set of channel estimate gains for a transmission channel in a communication system, comprising the steps of:

deriving a first set of channel estimates from symbols received through the transmission channel;

deriving a second set of channel estimates from symbols received through a second channel in the communication system;

determining a gain offset based on the first and second sets of channel estimates;

determining a set of channel estimate gains based on the gain offset and the first and second sets of channel estimates; and

associating the set of channel estimate gains with channel estimate phases of one of the first and second sets of channel estimates.

10. The method of claim 9, wherein the associated channel estimate phase is the one of the first and second sets of channel estimates being from a high-power channel.

11. The method of claim 10, wherein the associated channel estimate phase is the one of the first and second sets of channel estimates being from a DPCH channel.